

CLAIMS

1. A surface-treating process, wherein an inner surface of a vacuum member is mechanically polished in the presence of a liquid medium including no hydrogen atom.

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2. A surface-treating process according to claim 1, wherein the liquid medium including no hydrogen atom is a liquid at an ordinary temperature and an ordinary pressure and a saturated or unsaturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms.

3. A surface-treating process according to claim 1, wherein the vacuum member is made of one kind or two or more kinds selected from the group consisting of niobium, titanium, stainless steel, copper, aluminum and iron.

4. A surface-treating process according to claim 1, wherein the vacuum member is made of niobium.

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5. A surface-treating process according to claim 1, wherein the vacuum member is a superconducting accelerating cavity.

25 6. A surface-treating process according to claim 1, wherein the mechanical polishing is performed in the presence of an oxidizing material.

7. A surface-treating process according to claim 6,

wherein the oxidizing material is ozone, a mixture of ozone and oxygen, or hydrogen peroxide water.

8. A surface-treating process according to claim 1,
5 wherein after the mechanical polishing, the inner surface of a vacuum member is subjected to chemical polishing or electrochemical polishing.

9. A surface-treating process according to claim 1,
10 wherein after the mechanical polishing, the inner surface of a vacuum member is subjected to electrochemical polishing using an electrolytic solution including an oxidizing material.

10. A surface-treating process according to claim 9,
15 wherein the oxidizing material is ozone, hydrogen peroxide water or nitric acid.

11. A forming process for a vacuum member, wherein the vacuum member is mechanically formed in the presence of a liquid
20 medium including no hydrogen atom.

12. A vacuum member obtained by means of a surface-treating process according to claim 1 or a forming process according to claim 11.
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13. A vacuum member according to claim 12 being a superconducting accelerating cavity.

14. An electrolytic polishing solution including an

oxidizing material and used in electrochemical polishing of a vacuum member.